

Utah Department of Transportation Roadway Safety Improvement Program

October 2006

Utah's Implementation of the federal Highway Safety Improvement Program



Utah Department of Transportation
Division of Traffic and Safety



zero
Fatalities

A Goal We Can All Live With

Utah Roadway Safety Improvement (RSI) Program

UDOT Division of Traffic and Safety

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) established the Highway Safety Improvement Program (HSIP) as an FHWA “core” program. This significant move to emphasize traffic safety is intended to significantly reduce traffic fatalities and serious injuries on public roads. The move to elevate the HSIP Program was accompanied by a significant increase in funding; for Utah funding doubled. Details of the HSIP are contained in Section 148 of Title 23, United States Code. Subtitle D, Section 1401 from SAFETEA-LU, which specifies Section 148 of Title 23, is attached in Appendix A for reference.

This document details the implementation of the federal HSIP in Utah, titled the “Roadway Safety Improvement Program,” or RSI. Refinements of this process are anticipated as best practices are identified.

INTRODUCTION

SAFETEA-LU established incentives for states to develop and implement a “Strategic Highway Safety Plan” as part of HSIP. Utah’s Safety Leadership Team actually began the process to create a Comprehensive Safety Plan before the enactment of SAFETEA-LU. The primary purpose of the Roadway Safety Improvement (RSI) Program is to support the Utah Comprehensive Safety Plan (UCSP) by providing a means to implement selected safety improvements in support of the Plan.

The RSI Program has the following strategic goals for safety on Utah’s roads:

1. Reduce the number of traffic fatalities and serious injuries;
2. Reduce the number and severity of crashes;
3. Decrease the potential for crashes; and,
4. Maximize the benefit of limited safety funds.

The RSI Program accomplishes these strategic goals by:

- Collecting and maintaining a comprehensive database of traffic crashes;
- Screening the crash database to identify safety spot locations;
- Evaluating safety spot locations to determine appropriate action;
- Programming RSI projects to mitigate identified safety spot locations; and,
- Evaluating implemented RSI projects to determine effectiveness.

Details of the RSI Program are described below. The Program was developed to function within the STIP development process already established.

The RSI Program is administered by the UDOT Division of Traffic and Safety.

All public roadways in the state qualify for RSI funding. A special funding category within HSIP was also created by SAFETEA-LU called High Risk Rural Roads (HRRR). Funding within this category has limitations as follows:

- Functional classification must be a rural major or minor collector, or rural local road (mostly city and county roads); and,
- Crash rate for incapacitating and fatal injuries is greater than the statewide average; or,
- There is reason to believe that changed conditions on a qualifying route will create a condition where the crash rate for incapacitating and fatal injuries is greater than the statewide average.

The process to program HSIP funds and HRRR funding within the RSI Program is as follows:

PROCESS

The administration of the RSI Program consists of 6 distinct steps:

1. Planning;
2. Analysis;
3. Prioritization;
4. Programming;
5. Implementation; and,
6. Evaluation

Activities and responsibilities are assigned as noted for each task outlined in the process.

1. PLANNING

The core of any planning effort is accurate, timely data. The intention of RSI Program, consistent with federal requirements in SAFETEA-LU, is to make data-driven funding decisions. As such, the RSI Program relies heavily on:

- A. The collection of crash data on public roads;
- B. The collection and maintenance of roadway data; and,
- C. Analysis of the above data to identify locations that warrant further consideration.

The tool used to bring these elements together is UDOT's Safety Management System (SMS). SMS is used to receive electronic crash data from the Utah Highway Patrol. It also stores data input by the UDOT Accident Records Unit from hardcopy crash reports. SMS also has the capability to access roadway and other data stored within the UDOT data warehouse. Finally, SMS includes screening and reporting functions that facilitate the identification of safety spot locations in a statewide context.

A. Collection of Crash Data

UDOT currently maintains the official Utah crash database, which contains every reported accident that occurs within the state on a public roadway.

Responsibility: UDOT Traffic and Safety – Accident Records Unit

Note: Utah is in a transition period for crash data. In the past all of the data from the crash reports was entered manually by the Accident Records Unit within UDOT Traffic and Safety. Recent successful efforts to implement electronic data collection by the Utah Highway Patrol and other law enforcement agencies in Utah has reduced the load for manual data input. Ideally all

agencies will transmit electronically, thereby eliminating the need for manual input from the crash form. As of June 2006, approximately 30% of crash reports are submitted electronically.

With the advent of electronic submittal, there is an inevitable shift of responsibility that will occur to house the official crash database in the Utah Department of Public Safety. At some time in the future, the responsibility will shift and UDOT (including the RSI Program) will become a customer of Public Safety for crash data.

B. Collection of Traffic and Roadway Data

The Safety Management System (SMS) utilizes data from UDOT's location referencing system and features inventory to locate and characterize crashes and to calculate crash rates. Location referencing and the features inventory are populated and maintained by the Systems Planning and Programming Division. Currently, this data is limited to state routes and federal-aid routes. Crash data on City and County non-federal aid roads is also maintained, but cannot be location referenced as there are no route numbers or mileposts established on those routes. Therefore, analysis within SMS on the non-federal aid local routes can only be analyzed in aggregate.

Responsibility: UDOT Systems Planning and Programming

Note: One of the priorities established by the Traffic Records Coordinating Committee is to promote the use of GPS units to collect coordinates at crash sites. Some agencies are already doing this. Coordinates of crashes on local roads would eliminate the need for route and milepoints, thereby facilitating crash analysis on local roads.

Additionally, UDOT is currently working to establish a comprehensive data warehouse, which includes traffic and roadway data, as well as the crash data. Recorded roadway data will have date and time stamps which will facilitate faster and more accurate historical analyses.

C. Identification of Safety Spot Locations (SSL)

The initial effort for identifying safety improvement locations is to accumulate a list of locations throughout the State where the numbers of crashes and/or the severity of crashes are higher than expected, or where contributing circumstances are unknown. Potentially hazardous locations may be included in the list of SSLs based on a comparison to locations that displayed characteristics similar to those at improved locations before safety improvements, and resulted in documented accident reduction after the improvements. Substantially changed conditions may also be considered. At this point in the process, the scope of a potential project, or the likely funding source is not considered.

Assembling the SSL list occurs in three concurrent tasks:

- a. **Crash Data Screening.** A screening of the crash database is conducted by Traffic and Safety to identify candidate locations.

A planning level cost estimate is prepared for each identified SSL.

Responsibility: UDOT Traffic and Safety – Safety Programs Engineer

Note: Analysis capability at this time is limited to frequency studies. In the future as improvements are made to the Location Referencing System and data issues associated with changing the crash form and electronic crash data submission are

worked out, rate-based functions will be added to include safety performance functions in analysis.

1. **Phase 1** – Reporting functions developed within SMS, including limited statistical methods. Statistical analysis in this phase will be limited to the High Proportion Method and frequency studies.

2. **Phase 2** – Reporting functions in SMS with comprehensive statistical methods. [begin approximately Fall 2009] Statistical analysis using Safety Performance Functions (SPF) and before/after studies using Empirical Bayes Method will be implemented. It is necessary to wait for implementation of Phase 3 to allow sufficient data to accumulate using the new crash form, and to allow changes in the Location Referencing System to stabilize. Calculation of SPFs is highly dependent on linking the crash file to the roadway file.

b. **Region Recommendations.** The UDOT Regions create and maintain a list of SSLs. Each Region assigns a person to maintain this list and monitor the progress of safety projects in the Region.

A planning level cost estimate is prepared for each identified SSL.

Responsibility: Region Safety Projects Coordinator

c. **Other Recommendations.** Other state agencies, the FHWA, the Utah Highway Patrol, local law enforcement, local government officials, metropolitan planning organizations, and the general public provide input to the SSL list.

UDOT is partnering with the Utah Local Technical Assistance Program (LTAP) to encourage participation in the RSI Program among local jurisdictions. Participation among local jurisdictions is critical to achieve the goals within the Utah Comprehensive Safety Plan. UDOT also actively promotes the program to locals by participating in conferences by the Utah League of Cities and Towns and the Utah Association of Counties.

A planning level cost estimate is prepared for each identified SSL.

Responsibility: Other agencies/public

D. Timeline

The timeline for the RSI Program is established to support the annual STIP development process. It is the intention of Traffic and Safety to provide a list of recommended RSI Projects to the four UDOT Regions prior to the Region STIP workshops in January.

The latest date for submission of safety spot locations to the Engineer for Traffic and Safety is **OCTOBER 1st ANNUALLY** in order to be considered for programming in the current year's STIP process. **However, submissions may be made at any time prior to Oct. 1st in order to best accommodate Region schedules.** Turnaround time for Traffic and Safety is 60 days (to perform steps 2 and 3 below), so earlier submission dates should be planned accordingly.

Traffic and Safety's commitment is to support the Regions by providing RSI Program information in a complete and timely fashion.

2. ANALYSIS

A. Crash History

The 3-year crash history is assembled for each SSL. The crash history includes the latest available 3 years of crash data. Crash data for analysis will be limited to data from completed and closed crash files, unless there is a compelling reason to do otherwise.

Responsibility: UDOT Traffic and Safety – Safety Programs Engineer

B. Preliminary Evaluation of the 3-year Crash History

A preliminary analysis of the crash history is performed to identify patterns of crashes at each SSL that might be able to be mitigated through one or more mitigation measures. For submitted projects, the proposed mitigation is compared to the crash history to determine if the proposed mitigation measure is appropriate. Conceptual mitigation measures are identified in this step, but at this point the feasibility of any potential mitigation measure is unknown.

Responsibility: UDOT Traffic and Safety – Safety Programs Engineer

C. Preliminary Benefit-to-Cost Calculation

Based on the potential mitigation measures at each SSL, the expected benefit of those mitigations, and the cost estimate for each SSL, a preliminary benefit to cost ratio (B/C) is calculated. Proposed projects that have a B/C less than one and do not have substantially changed conditions are not viable RSI projects. No further consideration for RSI funding is given.

The B/C ratio is calculated using the spreadsheet in Appendix B. Key factors in the calculation are as follows:

- # of years of crash data included in the crash history
 - 3 years of crash data will be used to evaluate crash history
- # of people injured or deceased in the crashes included in the crash history
 - crash outcomes are evaluated on the person level
- Anticipated crash reduction factor for the proposed improvement(s)
 - use of Kentucky Transportation Center values (KTC 96-13) is recommended until current FHWA study concludes and can be evaluated
- Service life of the proposed improvement(s)
 - use of FHWA values from “Evaluation of Highway Safety Projects” is recommended (attached in Appendix B)
- Cost of the proposed improvement(s)
- Discount rate
- Average crash costs
 - FHWA Technical Advisory T7570.2, October 1994 provides the basis for crash costs (adjusted each year by FHWA). This data is updated annually by FHWA.
 - The FHWA crash costs are then adjusted to reflect the priority placed on serious injuries and fatalities prescribed in the Utah Comprehensive Safety Plan. The adjustment procedure is shown in Appendix B.

Responsibility: UDOT Traffic and Safety – Safety Programs Engineer

D. Coordination with current STIP

Each SSL is compared to UDOT's STIP to ensure coordination between the two. Potential SSL projects within the boundaries of a project on the STIP may be advanced in this process, but funding will be determined on a case-by-case basis. Whether or not the potential SSL project is funded, the safety information developed will be provided to the Region for use in the development of the STIP project.

Responsibility: UDOT Traffic and Safety – Safety Programs Engineer

E. Field Location Review (RSI only)

An on-site inspection or a review by video-log is made of each SSL that is advanced to the RSI Program. The field location review documents such things as constructability, geometric issues, traffic control, driver behavior, lighting, right of way issues, pedestrians and bicycles, and roadway surface. The Field Location Review is attended by the RSI Team, comprised of representatives of each of the interested parties at a given SSL.

A Location Review Report is prepared by the RSI Program Manager to describe the SSL, mitigation discussed, and preliminary recommendations for all sites inspected. The report is sent to the RSI Team members, FHWA, and Region Directors. The Location Review Report may recommend that a location is not appropriate for the RSI program, but the report may identify other methods for dealing with a problem at a given location.

Responsibility: UDOT Traffic and Safety – Safety Programs Engineer

3. PRIORITIZATION

A. SSL Refinement and Prioritization

Following analysis, a preliminary prioritization of the SSLs is prepared to create a draft RSI Program. Using the investigative file and Location Review Report, refinements are made to the B/C calculation to account for changes in scope resulting from the evaluation. With the final B/C calculations made, a preliminary priority listing is prepared by Traffic and Safety in consultation with the Region Directors. The prioritization focuses on supporting the Utah Comprehensive Safety Plan and considers such things as:

- a. Project cost;
- b. Project benefit;
- c. B/C ratio;
- d. Project development schedule;
- e. Statewide safety priorities;
- f. Region safety priorities;
- g. Coordination with other programmed UDOT projects; and,
- h. Allocation of apportioned funds to areas of the State as defined by current UDOT Region boundaries.

Responsibility: UDOT Traffic and Safety – Safety Programs Engineer

B. Timeline

The draft RSI Program, with estimated B/C ratios, is presented by Traffic and Safety for review to the Regions by **DECEMBER 1st ANNUALLY**. If an earlier submission is made, the deadline is 60 days after the submission is received by Traffic and Safety.

4. PROGRAMMING

A. Region STIP Workshops

The Regions use the draft RSI Program in preparation for the annual Region Statewide Transportation Improvement Program (STIP) workshops (usually held in January).

Responsibility: Region Safety Projects Coordinator

B. Final Programming

Following the Region STIP workshops, the Engineer for Traffic and Safety finalizes the RSI Program for that STIP year based on comments from the Region STIP workshops. The finalized RSI program is then submitted to the Transportation Commission for review at the April Commission STIP workshop.

Proposed RSI projects that do not make it into the STIP in the current year are carried over to the SSL list for programming consideration in the following year.

Responsibility: UDOT Traffic and Safety – Engineer for Traffic and Safety

5. IMPLEMENTATION

A. Assigning a Project Manager

The Region assigns a Project Manager to each Region RSI project.

Responsibility: Region Director

Traffic and Safety assigns a Project Manager to each statewide RSI project

Responsibility: Engineer for Traffic and Safety

B. Project Development, Advertisement and Construction

As with other UDOT projects, the Project Manager is responsible for the timely completion of the projects assigned. The Project Manager will involve the Traffic and Safety Division in the development of each project to ensure continuity from concept through construction. The FHWA Utah Safety Engineer will be included in the development of RSI projects.

Responsibility: Project Manager

C. Status Reports

The Region Safety Projects Coordinator will advise the Engineer for Traffic and Safety of the progress and status of each RSI Project, including construction dates. Failure to submit status reports will effect future allocation of RSI funds to the Region.

Responsibility: Region Safety Projects Coordinator

D. Timeline

The Region Safety Projects Coordinator submits the annual status report for each RSI project with the list of SSLs described in 1(D) above by **OCTOBER 1st ANNUALLY** to the Engineer for Traffic and Safety. Early submissions may also be made as previously described.

6. EVALUATION

A. Before / After Study

A before/after study will be conducted on each RSI project. The study will be based on a comparison of accidents three years prior to the improvement to three years following the improvement. The after period will conclude when the crash file is completed for the calendar year that includes the 36th month following the improvement. The comparison will be made for accident numbers, accident rates, and accident severity. The actual benefit-cost ratio will be calculated for each improvement.

Responsibility: UDOT Traffic and Safety – Safety Programs Engineer

B. Accident Reduction Factor Database

Based on the results of the before/after studies, UDOT Traffic and Safety will compile and maintain a database of accident reduction factors to be used in future planning efforts and B/C calculations.

Responsibility: UDOT Traffic and Safety – Safety Programs Engineer

Program Contact Information

Questions regarding the RSI Program should be directed to:

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APPENDIX A

SAFETEA-LU: HSIP DESCRIPTION

(2) **CONTRACT AUTHORITY.**—Funds made available to carry out this section shall be available for obligation in the same manner as if such funds were apportioned under chapter 1 of title 23, United States Code; except that such funds shall not be transferable and shall remain available until expended.

SEC. 1309. EXTENSION OF PUBLIC TRANSIT VEHICLE EXEMPTION FROM AXLE WEIGHT RESTRICTIONS.

Section 1023(h)(1) of the Intermodal Surface Transportation Efficiency Act of 1991 (23 U.S.C. 127 note; 106 Stat. 1552) is amended by striking “2005” and inserting “2009”.

SEC. 1310. INTERSTATE OASIS PROGRAM.

23 USC 111 note.

(a) **IN GENERAL.**—Not later than 180 days after the date of enactment of this section, in consultation with the States and other interested parties, the Secretary shall—

Deadline.

(1) establish an interstate oasis program; and

(2) after providing an opportunity for public comment, develop standards for designating, as an interstate oasis, a facility that—

Standards.

(A) offers—

(i) products and services to the public;

(ii) 24-hour access to restrooms; and

(iii) parking for automobiles and heavy trucks; and

(B) meets other standards established by the Secretary.

(b) **STANDARDS FOR DESIGNATION.**—The standards for designation under subsection (a) shall include standards relating to—

(1) the appearance of a facility; and

(2) the proximity of the facility to the Dwight D. Eisenhower National System of Interstate and Defense Highways.

(c) **ELIGIBILITY FOR DESIGNATION.**—If a State (as defined in section 101(a) of title 23, United States Code) elects to participate in the interstate oasis program, any facility meeting the standards established by the Secretary shall be eligible for designation under this section.

(d) **LOGO.**—The Secretary shall design a logo to be displayed by a facility designated under this section.

Subtitle D—Highway Safety

SEC. 1401. HIGHWAY SAFETY IMPROVEMENT PROGRAM.

(a) **SAFETY IMPROVEMENT.**—

(1) **IN GENERAL.**—Section 148 of title 23, United States Code, is amended to read as follows:

“§ 148. Highway safety improvement program

“(a) **DEFINITIONS.**—In this section, the following definitions apply:

“(1) **HIGH RISK RURAL ROAD.**—The term ‘high risk rural road’ means any roadway functionally classified as a rural major or minor collector or a rural local road—

“(A) on which the accident rate for fatalities and incapacitating injuries exceeds the statewide average for those functional classes of roadway; or

“(B) that will likely have increases in traffic volume that are likely to create an accident rate for fatalities

and incapacitating injuries that exceeds the statewide average for those functional classes of roadway.

“(2) HIGHWAY SAFETY IMPROVEMENT PROGRAM.—The term ‘highway safety improvement program’ means the program carried out under this section.

“(3) HIGHWAY SAFETY IMPROVEMENT PROJECT.—

“(A) IN GENERAL.—The term ‘highway safety improvement project’ means a project described in the State strategic highway safety plan that—

“(i) corrects or improves a hazardous road location or feature; or

“(ii) addresses a highway safety problem.

“(B) INCLUSIONS.—The term ‘highway safety improvement project’ includes a project for one or more of the following:

“(i) An intersection safety improvement.

“(ii) Pavement and shoulder widening (including addition of a passing lane to remedy an unsafe condition).

“(iii) Installation of rumble strips or another warning device, if the rumble strips or other warning devices do not adversely affect the safety or mobility of bicyclists, pedestrians, and the disabled.

“(iv) Installation of a skid-resistant surface at an intersection or other location with a high frequency of accidents.

“(v) An improvement for pedestrian or bicyclist safety or safety of the disabled.

“(vi) Construction of any project for the elimination of hazards at a railway-highway crossing that is eligible for funding under section 130, including the separation or protection of grades at railway-highway crossings.

“(vii) Construction of a railway-highway crossing safety feature, including installation of protective devices.

“(viii) The conduct of a model traffic enforcement activity at a railway-highway crossing.

“(ix) Construction of a traffic calming feature.

“(x) Elimination of a roadside obstacle.

“(xi) Improvement of highway signage and pavement markings.

“(xii) Installation of a priority control system for emergency vehicles at signalized intersections.

“(xiii) Installation of a traffic control or other warning device at a location with high accident potential.

“(xiv) Safety-conscious planning.

“(xv) Improvement in the collection and analysis of crash data.

“(xvi) Planning integrated interoperable emergency communications equipment, operational activities, or traffic enforcement activities (including police assistance) relating to workzone safety.

“(xvii) Installation of guardrails, barriers (including barriers between construction work zones

and traffic lanes for the safety of motorists and workers), and crash attenuators.

“(xviii) The addition or retrofitting of structures or other measures to eliminate or reduce accidents involving vehicles and wildlife.

“(xix) Installation and maintenance of signs (including fluorescent, yellow-green signs) at pedestrian-bicycle crossings and in school zones.

“(xx) Construction and yellow-green signs at pedestrian-bicycle crossings and in school zones.

“(xxi) Construction and operational improvements on high risk rural roads.

“(4) SAFETY PROJECT UNDER ANY OTHER SECTION.—

“(A) IN GENERAL.—The term ‘safety project under any other section’ means a project carried out for the purpose of safety under any other section of this title.

“(B) INCLUSION.—The term ‘safety project under any other section’ includes a project to promote the awareness of the public and educate the public concerning highway safety matters (including motorcyclist safety) and a project to enforce highway safety laws.

“(5) STATE HIGHWAY SAFETY IMPROVEMENT PROGRAM.—The term ‘State highway safety improvement program’ means projects or strategies included in the State strategic highway safety plan carried out as part of the State transportation improvement program under section 135(g).

“(6) STATE STRATEGIC HIGHWAY SAFETY PLAN.—The term ‘State strategic highway safety plan’ means a plan developed by the State transportation department that—

“(A) is developed after consultation with—

“(i) a highway safety representative of the Governor of the State;

“(ii) regional transportation planning organizations and metropolitan planning organizations, if any;

“(iii) representatives of major modes of transportation;

“(iv) State and local traffic enforcement officials;

“(v) persons responsible for administering section 130 at the State level;

“(vi) representatives conducting Operation Life-saver;

“(vii) representatives conducting a motor carrier safety program under section 31102, 31106, or 31309 of title 49;

“(viii) motor vehicle administration agencies; and

“(ix) other major State and local safety stakeholders;

“(B) analyzes and makes effective use of State, regional, or local crash data;

“(C) addresses engineering, management, operation, education, enforcement, and emergency services elements (including integrated, interoperable emergency communications) of highway safety as key factors in evaluating highway projects;

“(D) considers safety needs of, and high-fatality segments of, public roads;

“(E) considers the results of State, regional, or local transportation and highway safety planning processes;

“(F) describes a program of projects or strategies to reduce or eliminate safety hazards;

“(G) is approved by the Governor of the State or a responsible State agency; and

“(H) is consistent with the requirements of section 135(g).

“(b) PROGRAM.—

“(1) IN GENERAL.—The Secretary shall carry out a highway safety improvement program.

“(2) PURPOSE.—The purpose of the highway safety improvement program shall be to achieve a significant reduction in traffic fatalities and serious injuries on public roads.

“(c) ELIGIBILITY.—

“(1) IN GENERAL.—To obligate funds apportioned under section 104(b)(5) to carry out this section, a State shall have in effect a State highway safety improvement program under which the State—

“(A) develops and implements a State strategic highway safety plan that identifies and analyzes highway safety problems and opportunities as provided in paragraph (2);

“(B) produces a program of projects or strategies to reduce identified safety problems;

“(C) evaluates the plan on a regular basis to ensure the accuracy of the data and priority of proposed improvements; and

“(D) submits to the Secretary an annual report that—

“(i) describes, in a clearly understandable fashion, not less than 5 percent of locations determined by the State, using criteria established in accordance with paragraph (2)(B)(ii), as exhibiting the most severe safety needs; and

“(ii) contains an assessment of—

“(I) potential remedies to hazardous locations identified;

“(II) estimated costs associated with those remedies; and

“(III) impediments to implementation other than cost associated with those remedies.

“(2) IDENTIFICATION AND ANALYSIS OF HIGHWAY SAFETY PROBLEMS AND OPPORTUNITIES.—As part of the State strategic highway safety plan, a State shall—

“(A) have in place a crash data system with the ability to perform safety problem identification and countermeasure analysis;

“(B) based on the analysis required by subparagraph (A)—

“(i) identify hazardous locations, sections, and elements (including roadside obstacles, railway-highway crossing needs, and unmarked or poorly marked roads) that constitute a danger to motorists (including motorcyclists), bicyclists, pedestrians, and other highway users; and

“(ii) using such criteria as the State determines to be appropriate, establish the relative severity of

Reports.

those locations, in terms of accidents, injuries, deaths, traffic volume levels, and other relevant data;

“(C) adopt strategic and performance-based goals that—

“(i) address traffic safety, including behavioral and infrastructure problems and opportunities on all public roads;

“(ii) focus resources on areas of greatest need; and

“(iii) are coordinated with other State highway safety programs;

“(D) advance the capabilities of the State for traffic records data collection, analysis, and integration with other sources of safety data (such as road inventories) in a manner that—

“(i) complements the State highway safety program under chapter 4 and the commercial vehicle safety plan under section 31102 of title 49;

“(ii) includes all public roads;

“(iii) identifies hazardous locations, sections, and elements on public roads that constitute a danger to motorists (including motorcyclists), bicyclists, pedestrians, the disabled, and other highway users; and

“(iv) includes a means of identifying the relative severity of hazardous locations described in clause (iii) in terms of accidents, injuries, deaths, and traffic volume levels;

“(E)(i) determine priorities for the correction of hazardous road locations, sections, and elements (including railway-highway crossing improvements), as identified through crash data analysis;

“(ii) identify opportunities for preventing the development of such hazardous conditions; and

“(iii) establish and implement a schedule of highway safety improvement projects for hazard correction and hazard prevention; and

“(F)(i) establish an evaluation process to analyze and assess results achieved by highway safety improvement projects carried out in accordance with procedures and criteria established by this section; and

“(ii) use the information obtained under clause (i) in setting priorities for highway safety improvement projects.

“(d) ELIGIBLE PROJECTS.—

“(1) IN GENERAL.—A State may obligate funds apportioned to the State under section 104(b)(5) to carry out—

“(A) any highway safety improvement project on any public road or publicly owned bicycle or pedestrian pathway or trail; or

“(B) as provided in subsection (e), other safety projects.

“(2) USE OF OTHER FUNDING FOR SAFETY.—

“(A) EFFECT OF SECTION.—Nothing in this section prohibits the use of funds made available under other provisions of this title for highway safety improvement projects.

“(B) USE OF OTHER FUNDS.—States are encouraged to address the full scope of their safety needs and opportunities by using funds made available under other provisions of this title (except a provision that specifically prohibits that use).

“(e) FLEXIBLE FUNDING FOR STATES WITH A STRATEGIC HIGHWAY SAFETY PLAN.—

Certification.

“(1) IN GENERAL.—To further the implementation of a State strategic highway safety plan, a State may use up to 10 percent of the amount of funds apportioned to the State under section 104(b)(5) for a fiscal year to carry out safety projects under any other section as provided in the State strategic highway safety plan if the State certifies that—

“(A) the State has met needs in the State relating to railway-highway crossings; and

“(B) the State has met the State’s infrastructure safety needs relating to highway safety improvement projects.

“(2) OTHER TRANSPORTATION AND HIGHWAY SAFETY PLANS.—Nothing in this subsection requires a State to revise any State process, plan, or program in effect on the date of enactment of this section.

“(f) HIGH RISK RURAL ROADS.—

“(1) IN GENERAL.—After making an apportionment under section 104(b)(5) for a fiscal year beginning after September 30, 2005, the Secretary shall ensure, from amounts made available to carry out this section for such fiscal year, that a total of \$90,000,000 of such apportionment is set aside by the States, proportionally according to the share of each State of the total amount so apportioned, for use only for construction and operational improvements on high risk rural roads.

“(2) SPECIAL RULE.—A State may use funds apportioned to the State pursuant to this subsection for any project under this section if the State certifies to the Secretary that the State has met all of State needs for construction and operational improvements on high risk rural roads.

“(g) REPORTS.—

“(1) IN GENERAL.—A State shall submit to the Secretary a report that—

“(A) describes progress being made to implement highway safety improvement projects under this section;

“(B) assesses the effectiveness of those improvements; and

“(C) describes the extent to which the improvements funded under this section contribute to the goals of—

“(i) reducing the number of fatalities on roadways;

“(ii) reducing the number of roadway-related injuries;

“(iii) reducing the occurrences of roadway-related crashes;

“(iv) mitigating the consequences of roadway-related crashes; and

“(v) reducing the occurrences of crashes at railway-highway crossings.

“(2) CONTENTS; SCHEDULE.—The Secretary shall establish the content and schedule for a report under paragraph (1).

“(3) TRANSPARENCY.—The Secretary shall make reports submitted under subsection (c)(1)(D) available to the public through—

“(A) the Web site of the Department; and

“(B) such other means as the Secretary determines to be appropriate.

Public
information.

“(4) DISCOVERY AND ADMISSION INTO EVIDENCE OF CERTAIN REPORTS, SURVEYS, AND INFORMATION.—Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for any purpose directly relating to paragraph (1) or subsection (c)(1)(D), or published by the Secretary in accordance with paragraph (3), shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location identified or addressed in such reports, surveys, schedules, lists, or other data.

“(h) FEDERAL SHARE OF HIGHWAY SAFETY IMPROVEMENT PROJECTS.—Except as provided in sections 120 and 130, the Federal share of the cost of a highway safety improvement project carried out with funds apportioned to a State under section 104(b)(5) shall be 90 percent.”.

(2) CLERICAL AMENDMENT.—The analysis for chapter 1 of such title is amended by striking the item relating to section 148 and inserting the following:

“148. Highway safety improvement program.”.

(3) CONFORMING AMENDMENTS.—

(A) TRANSFERS OF APPORTIONMENTS.—Section 104(g) of such title is amended in the first sentence by striking “sections 130, 144, and 152 of this title” and inserting “sections 130 and 144”.

(B) UNIFORM TRANSFERABILITY.—Section 126(a) of such title is amended by inserting “under” after “State’s apportionment”.

(C) OTHER SECTIONS.—Sections 154, 164, and 409 of such title are amended by striking “152” each place it appears and inserting “148”.

(b) APPORTIONMENT OF HIGHWAY SAFETY IMPROVEMENT PROGRAM FUNDS.—Section 104(b) of such title (as amended by section 1103 of this Act) is amended—

(1) in the matter preceding paragraph (1), by inserting after “Improvement program,” the following: “the highway safety improvement program,”; and

(2) by adding at the end the following:

“(5) HIGHWAY SAFETY IMPROVEMENT PROGRAM.—

“(A) IN GENERAL.—For the highway safety improvement program, in accordance with the following formula:

“(i) $33\frac{1}{3}$ percent of the apportionments in the ratio that—

“(I) the total lane miles of Federal-aid highways in each State; bears to

“(II) the total lane miles of Federal-aid highways in all States.

“(ii) $33\frac{1}{3}$ percent of the apportionments in the ratio that—

“(I) the total vehicle miles traveled on lanes on Federal-aid highways in each State; bears to

“(II) the total vehicle miles traveled on lanes on Federal-aid highways in all States.

“(iii) $33\frac{1}{3}$ percent of the apportionments in the ratio that—

“(I) the number of fatalities on the Federal-aid system in each State in the latest fiscal year for which data are available; bears to

“(II) the number of fatalities on the Federal-aid system in all States in the latest fiscal year for which data are available.

“(B) MINIMUM APPORTIONMENT.—Notwithstanding subparagraph (A), each State shall receive a minimum of one-half of 1 percent of the funds apportioned under this paragraph.”.

(d) ELIMINATION OF HAZARDS RELATING TO RAILWAY-HIGHWAY CROSSINGS.—

(1) FUNDS FOR PROTECTIVE DEVICES.—Section 130(e) of such title is amended—

(A) by striking “At” and inserting the following:

“(1) IN GENERAL.—Before making an apportionment under section 104(b)(5) for a fiscal year, the Secretary shall set aside, from amounts made available to carry out the highway safety improvement program under section 148 for such fiscal year, at least \$220,000,000 for the elimination of hazards and the installation of protective devices at railway-highway crossings. At”; and

(B) by adding at the end the following:

“(2) SPECIAL RULE.—If a State demonstrates to the satisfaction of the Secretary that the State has met all its needs for installation of protective devices at railway-highway crossings, the State may use funds made available by this section for other purposes under this subsection.”.

(2) APPORTIONMENT.—Section 130(f) of such title is amended to read as follows:

“(f) APPORTIONMENT.—

“(1) FORMULA.—Fifty percent of the funds set aside to carry out this section pursuant to subsection (e)(1) shall be apportioned to the States in accordance with the formula set forth in section 104(b)(3)(A), and 50 percent of such funds shall be apportioned to the States in the ratio that total public railway-highway crossings in each State bears to the total of such crossings in all States.

“(2) MINIMUM APPORTIONMENT.—Notwithstanding paragraph (1), each State shall receive a minimum of one-half of 1 percent of the funds apportioned under paragraph (1).

“(3) FEDERAL SHARE.—The Federal share payable on account of any project financed with funds set aside to carry out this section shall be 90 percent of the cost thereof.”.

(3) BIENNIAL REPORTS TO CONGRESS.—Section 130(g) of such title is amended in the third sentence—

(A) by inserting “and the Committee on Commerce, Science, and Transportation,” after “Public Works”; and

(B) by striking “not later than April 1 of each year” and inserting “, not later than April 1, 2006, and every 2 years thereafter,”.

(4) EXPENDITURE OF FUNDS.—Section 130 of such title is amended by adding at the end the following:

“(k) EXPENDITURE OF FUNDS.—Not more than 2 percent of funds apportioned to a State to carry out this section may be used by the State for compilation and analysis of data in support of activities carried out under subsection (g).”.

(e) TRANSITION.—

23 USC 148 note.

(1) IMPLEMENTATION.—Except as provided in paragraph (2), the Secretary shall approve obligations of funds apportioned under section 104(b)(5) of title 23, United States Code (as added by subsection (b)), to carry out section 148 of that title, only if, not later than October 1 of the second fiscal year beginning after the date of enactment of this Act, a State has developed and implemented a State strategic highway safety plan as required pursuant to section 148(c) of that title.

Deadline.

(2) INTERIM PERIOD.—

(A) IN GENERAL.—Before October 1 of the second fiscal year after the date of enactment of this Act and until the date on which a State develops and implements a State strategic highway safety plan, the Secretary shall apportion funds to a State for the highway safety improvement program and the State may obligate funds apportioned to the State for the highway safety improvement program under section 148 for projects that were eligible for funding under sections 130 and 152 of that title, as in effect on the day before the date of enactment of this Act.

(B) NO STRATEGIC HIGHWAY SAFETY PLAN.—If a State has not developed a strategic highway safety plan by October 1, 2007, the State shall receive for the highway safety improvement program for each subsequent fiscal year until the date of development of such plan an amount that equals the amount apportioned to the State for that program for fiscal year 2007.

SEC. 1402. WORKER INJURY PREVENTION AND FREE FLOW OF VEHICULAR TRAFFIC.

Deadline.
Regulations.
23 USC 401 note.

Not later than 1 year after the date of enactment of this Act, the Secretary shall issue regulations to decrease the likelihood of worker injury and maintain the free flow of vehicular traffic by requiring workers whose duties place them on or in close proximity to a Federal-aid highway (as defined in section 101 of title 23, United States Code) to wear high visibility garments. The regulations may also require such other worker-safety measures for workers with those duties as the Secretary determines to be appropriate.

SEC. 1403. TOLL FACILITIES WORKPLACE SAFETY STUDY.

(a) IN GENERAL.—The Secretary shall conduct a study on the safety of highway toll collection facilities, including toll booths, to determine the safety of the facilities for the toll collectors who work in and around the facilities, including consideration of—

(1) the effect of design or construction of the facilities on the likelihood of vehicle collisions with the facilities;

(2) the safety of crosswalks used by toll collectors in transit to and from toll booths;

(3) the extent of the enforcement of speed limits in the vicinity of the facilities;

(4) the use of warning devices, such as vibration and rumble strips, to alert drivers approaching the facilities;

(5) the use of cameras to record traffic violations in the vicinity of the facilities;

(6) the use of traffic control arms in the vicinity of the facilities;

APPENDIX B

Benefit / Cost Information

Determination of Adjusted Crash Costs for B/C Calculation
2005 Crash file
Oct-06

All Roads in Utah

Raw Values (based on latest FHWA crash costs)

Severity	# crashes	Cost/crash	Proportion of PDO	Total Cost per Category	% of Total Cost
1	35158	\$ 2,600	1.0	\$ 91,410,800	4.3%
2	11313	\$ 25,000	9.6	\$ 282,825,000	13.4%
3	5113	\$ 47,000	18	\$ 240,311,000	11.4%
4	3116	\$ 230,000	88	\$ 716,680,000	33.9%
5	238	\$ 3,300,000	1269	\$ 785,400,000	37.1%
<hr/>					
All (Ave)	54938	\$ 38,527.55		\$ 2,116,626,800	100%

Base Cost 2315 (PDO)

Adjusted Values

Severity	# crashes	Cost/crash	Proportion of PDO	Total Cost per Category	% of Total Cost
1	34221	\$ 2,315	1.00	\$ 79,221,615	3.7%
2	11350	\$ 23,150	10.00	\$ 262,752,500	12.4%
3	4992	\$ 46,300	20.00	\$ 231,129,600	10.9%
4	3083	\$ 463,000	200.0	\$ 1,427,429,000	67.3%
5	259	\$ 463,000	200.0	\$ 119,917,000	5.7%
<hr/>					
All (Ave)	53905	\$ 39,336.79		\$ 2,120,449,715	100%

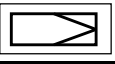
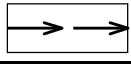
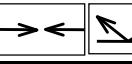

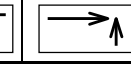
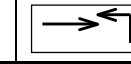

Deviation from "Raw" value 0.18%

Use	
Severity	Cost/Crash
1	\$ 2,350
2	\$ 23,200
3	\$ 46,500
4	\$ 465,000
5	\$ 465,000

**SAFETY IMPROVEMENT PROJECT CODES, DESCRIPTIONS, AND
SERVICE LIVES USED IN EFFECTIVENESS EVALUATION**

<u>Code</u>	<u>Description</u>	<u>Service Life (Years)</u>
<u>Intersection Projects</u>		
10	Channelization, left-turn bay	10
11	Traffic signals	10
12	Combination of 10 and 11	10
13	Sight distance improved	10
19	Other intersection, except structures	10
1A	Combination of 10 and 19	10
1B	Combination of 11, 13, 19, 65	10
<u>Cross Section Projects</u>		
20	Pavement widening, no lanes added	20
21	Lanes added without new median	20
22	Highway divided, new median added	20
23	Shoulder widening or improvement	20
24	Combination of 20-23	20
25	Skid treatment - grooving	10
26	Skid treatment - overlay	10
27	Flattening, clearing side slopes	20
29	Other cross section or combinations of 20-27	20
2A	Combination of 20 and 26	15
<u>Structures</u>		
30	Widening bridge or major structure	20
31	Replace bridge or major structure	30
32	New bridge or major structure (except 34 and 51)	30
33	Minor structure	20
34	Pedestrian over- or under-crossing	30
39	Other structure	20
<u>Alignment Projects</u>		
40	Horizontal alignment changes (except 52)	20
41	Vertical alignment changes	20
42	Combination of 40 and 41	20
49	Other alignments	20
<u>Railroad Grade Crossing Projects</u>		
50	Flashing lights replacing signs	10
51	Elimination by new or reconstructed grade separation	30
52	Elimination by relocation of highway or railroad	30
53	Illumination	10
54	Flashing lights replacing active devices	10
55	Automatic gates replacing signs	10
56	Automatic gates replacing active devices	10
57	Signing, marking	10
58	Crossing surface improvement	10
59	Other RR grade crossing	10
5A	Any combination of 50, 54, 55, 56, 57, 58	10
<u>Roadside Appurtenances</u>		
60	Traffic signs	6
61	Breakaway sign or luminaire supports	10
62	Road edge guardrail	10
63	Median barrier	15
64	Markings, delineators	2
65	Lighting	15
66	Improve drainage structures	20
67	Fencing	10
68	Impact attenuators	10
69	Other roadside	10
6A	Combination of 60-64	10
6B	Combination of 64 and 68	10
6C	Combination of 60 and 62	3
6D	Combination of 60 and 64	4
6E	Combination of 62 and 69	10
6F	Combination of 62, 66 and 69	10
6G	Combination of 60 and 63	10
<u>Other Safety Improvements</u>		
90	Safety provisions for roadside features and appurtenances	20
99	All projects not otherwise classifiable	20
9A	Combination of 11, 26, 59	10
9B	Combination of 26, and 66	15
9C	Combination of 27, 30, 62 and 99	20
9D	Combination of 11 and 60	3
9E	Combination of 11 and 64	6
9F	Combination of 22, 26, and 62	15
9G	Combination of 27, 57, 62, 64	10
9H	Combination of 22, 39, 65	20
9I	Combination of 23, 61, 62, 64, 65, 66	15

Roadway Safety Improvement Worksheet

			RSI Program Year:								
			State Route/ FAU Route/ FAS Route/ Local Route	Location	Beginning Accum. MP	Ending Accum. MP	Jurisdiction	Study Period Begins	Study Period Ends		
			<<Example>>								
Description of Proposed Work											
Collision Types	Injury Severity Distribution		17 Single Vehicle 	03 Rear End - Same Dir, Both Veh. Straight 	01, 06 Head On/Side Swipe - Opp Dir, Both Veh. Straight 	02 Lt Turn - Opp Dir, 1 Veh Straight 1 Veh. Lt 	11 Right Angle - App. At angle, Both Veh. Strt 	14 Right Angle Lt 1 Veh Strt, 1 Veh Lt 	07 Side Swipe - Same Dir, Both Veh Straight 	All Other Collision Types	Total
	Study Period: Number of Injuries (A)	Fatal Injury PDO	5 4 3 2 1	1 3 4 3 1	0 2 3 5 16	1 2 5 7 18	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	2 7 12 15 35
Total			12	26	33	0	0	0	0	0	71
Estimated Reduction Factors (B)	Fatal	5	65%	10%	75%	0%	0%	0%	0%	0%	
	Injury	4	50%	10%	50%	0%	0%	0%	0%	0%	
		3	50%	10%	50%	0%	0%	0%	0%	0%	
		2	50%	10%	50%	0%	0%	0%	0%	0%	
	PDO	1	20%	10%	50%	0%	0%	0%	0%	0%	
Estimated Reduction in Crashes (A x B)	Fatal	5	0.65		0.75						1.40
	Injury	4	1.50	0.20	1.00						2.70
		3	2.00	0.30	2.50						4.80
		2	1.50	0.50	3.50						5.50
	PDO	1	0.20	1.60	9.00						10.80
Total			5.85	2.60	16.75	0.00	0.00	0.00	0.00	0.00	25.20

Year (RSI Project Construction)	2005	Crash Severity	Est. Red. of Crashes (Total)	Est. Annual Red. of Crashes	Average Cost per Crash (FHWA)	Estimated Annual Cost Saving (Benefit)
Project Cost (exclude Right of Way)	\$ 1,500,000	5	1.40	0.47	\$ 465,000	\$ 217,000
Right of Way Costs (optional)	\$ -	4	2.70	0.90	\$ 465,000	\$ 418,500
Traffic Growth Factor	1.0%	3	4.80	1.60	\$ 46,500	\$ 74,400
CAPITAL RECOVERY		2	5.50	1.83	\$ 23,200	\$ 42,533
Discount Rate	9.0%	1	10.80	3.60	\$ 2,350	\$ 8,460
Project Service Life (yrs)	20	Total	25.20	8.40		\$ 760,893

$$B/C = 5.41$$

Using present worth values:

$$\text{Benefit} = \$ 8,110,035$$

$$\text{Cost} = \$ 1,500,000$$

See "Calculations" sheet for amortization.

*Change only yellow-shaded boxes



Amortizing...

[illegible]

Totals =	\$ 8,110,035	\$ 1,500,000
	(Benefit)	(Cost)

year (n)= 1, 2, 3,....

discount rate (i) = 9%

$$\text{Crash Benefits (@ year n)} = (\text{Crash Benefits})_{n-1} \times (1 + \text{Traffic Growth Factor})$$

$$\text{Present Worth Benefits} = (\text{Crash Benefits})_n \times 1/(1 + \text{Discount Rate})^n$$